

Ref. No.: PESL/CS/STP/ Clari-01 &Amd-02

Date 23/08/2024

<< TO ALL THE BIDDERS THROUGH PORTAL >>

Sub.: **Clarification No-01 & Amendment No-02** to Bidding Documents for “**Empanelment of Channel Partners for Rate Contract for execution of works of Rooftop Solar PV installation in residential sector under PM Surya Ghar - Muft Bijli Yojna (PMMSGY) - For Ladakh, Lakshadweep, Puducherry & Odisha**”

- (i) Ladakh , Spec No: CC/NT/W-MISC/DOM/T00/24/ 10688,
- (ii) Lakshadweep, Spec No:CC/NT/W-MISC/DOM/T00 /24 /10689
- (iii) Puducherry, Spec No: CC/NT/W-MISC/DOM/T00/24 /10690
- (iv) Odisha, Spec No: CC/NT/W-MISC/DOM/T00/24 /10691

Dear Sir,

1.0 This has reference to the bidding documents for the subject Packages uploaded in the portal <https://etender.powergrid.in> for the following packages, Please find enclosed herewith **Clarification No-01 & Amendment No-02** to the Bidding Documents, which shall form an integral part of the Bidding Documents.

Sl	Package Reference	Name of Package	Rfx Number in e-Tender Portal
1	RTS-01	Empanelment of channel partner for installation of Rooftop Solar system for residential consumers under PM Surya Ghar-Muft Bijli Yojana in Ladakh , Spec No: CC/NT/W-MISC/DOM/T00/24/ 10688,	5002003749
2	RTS-02	Empanelment of channel partner for installation of Rooftop Solar system for residential consumers under PM Surya Ghar-Muft Bijli Yojana in Lakshadweep, Spec No:CC/NT/W-MISC/DOM/T00 /24 /10689	5002003750
3	RTS-03	Empanelment of channel partner for installation of Rooftop Solar system for residential consumers under PM Surya Ghar-Muft Bijli Yojana in Puducherry, Spec No: CC/NT/W-MISC/DOM/T00/24 /10690	5002003751
4	RTS-04	Empanelment of channel partner for installation of Rooftop Solar system for residential consumers under PM Surya Ghar-Muft Bijli Yojana in Odisha, Spec No: CC/NT/W-MISC/DOM/T00/24 /10691	5002003752

- 3.0 Save and except the above, all other terms and conditions of the Bidding Documents shall remain unchanged.

Thanking you,

For and On behalf of
Power Grid Energy Services Limited



Janardhanarao.B
DGM (CS)

Clarification No. 1 to Bidding Documents:

Empanelment of Channel Partners for Rate Contract for execution of works of Rooftop Solar PV installation in residential sector under PM Surya Ghar – Muft Bijli Yojna (PMSGY) – For Ladakh, Lakshadweep, Puducherry & Odisha .

Sr. No	Clause No.	Clause Description	Bidder Queries	PESL REPLY
1	ITB 6.4	Supplementing Clause ITB 6.4 with the following: <u>Venue, date and time for Pre-bid Meeting:</u> The Bidder's designated representatives are.....	Online Meeting Link: We kindly request you to share the online link for the meeting scheduled on the 12th of August, 2024.	Pre Bidding Meeting was conducted through On line Team Meeting and link for the same was published in e-Tender Portal through Amednment-01.
2	IFB 3.1 Para-06	Channel Partners meeting the prescribed Technical and Financial QR shall be selected based on the lowest evaluated price for installation of Rooftop Solar Plants. The price shall be discovered for the range of 1-2KW on per KW basis. The quoted price per kW.....	System Size Quotation: Could you please confirm if bidders are allowed to quote for specific system sizes, such as 5KW or 10KW, instead of only per KW. This is beneficial for both bidder & PGCIL, as Panel is priced pro-rata per Watt, but not inverters.	Bidder has to quote on per KW basis only as per the provisions of bidding documents
3	GCC Clause Ref. No: 8.1	In accordance with the provisions of GCC Clause 12 (Terms of Payment), the Employer shall pay the Contractor in the following manner and at the following times, based on the Price Break down given in the.....	Payment Terms Clarification: We seek clarification on the payment terms from the vendor to the beneficiary, or will bidder get payment from PGCIL.	As per Clause ITB 1.1, the Employer is PESL. Payment will be release to Channel Partner by Employer.

Clarification No. 1 to Bidding Documents:

Empanelment of Channel Partners for Rate Contract for execution of works of Rooftop Solar PV installation in residential sector under PM Surya Ghar – Muft Bijli Yojna (PMSGY) – For Ladakh, Lakshadweep, Puducherry & Odisha .

4	Vol-II, Technical Specifications		Roof Condition Assumptions: We would appreciate it if you could clarify the assumptions taken regarding the roof conditions for the installations to be done on beneficiary.	Bidder shall be required to quote as per the provisions of the bidding documents.
5	Vol-II, Technical Specifications		Technical Specifications: Could you please provide detailed technical specifications for the systems to be installed?	Technical specification has already been provided with the bidding documents. Bidder may quote as per the provisions of the bidding documents.
6	IFB 3.0	PESL, therefore, invites Proposals / Bids from eligible Channel partners/ bidders for the following packages on.....	Future Enlistments: Lastly, we would like to know if there will be separate enlistments by PGCIL for West Bengal, Bihar, or Tripura in the future.	Bidder shall quote as per the provisions of the bidding documents.

Amendment No. 02 to Bidding Documents:

Empanelment of Channel Partners for Rate Contract for execution of works of Rooftop Solar PV installation in residential sector under PM Surya Ghar - Muft Bijli Yojna (PMSGY) - For Ladakh, Lakshadweep, Puducherry & Odisha .

Sl	Clause, Page No.	Existing Clause	Amended Clause
Solar PV Modules			
1	Clause: 1.0 (2), Page 12 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	The PV modules used must conform to the latest edition of IEC standards or equivalent BIS standards, i.e. IEC 61215/IS14286, IEC 61853-Part I/IS 16170-Part I, IEC 61730 Part-1 & Part 2 and IEC 62804. For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must also qualify to IEC 61701/IS 61701.	The PV modules used must qualify to the latest edition of IEC standards or equivalent BIS standards, i.e. IEC 61215/IS 14286, IEC 61853-Part I or IS 16170-Part I, IS/IEC 61730 Part-1 & Part 2 and IS 17210(part 1) or IEC 62804-1 (PID) . For the PV modules to be used in a highly corrosive atmosphere throughout their lifetime, they must qualify to IEC 61701/IS 61701. Thin - Film terrestrial photovoltaic (PV) modules must qualify to IS 16077: 2013 / IEC 61646: 2008.
2	Clause: 1.0 (18), Page 13 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	New Clause	The peak-power point current of any supplied module string (series connected modules) shall not vary by +1% from the respective arithmetic means for all modules and/or for all module strings (connected to the same MPPT), as the case may be. The peak-power point voltage of any supplied module string (series connected modules) shall not vary by + 2% from the respective arithmetic means for all modules and/or for all module strings (connected to the same MPPT), as the case may be.

Sl	Clause, Page No.	Existing Clause	Amended Clause
3	Clause: 1.0 (6), Page 12 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	The temperature co-efficient power of the PV module shall be equal to or better than - 0.40%/°C.	The temperature co-efficient power of the PV module shall be equal to or better than -0.4%/°C for crystalline modules and -0.3 %/°C for thin films modules.
4	Clause: 1.0 (11), Page 12 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	Solar PV modules used in solar power plants/ systems must be warranted for their output peak watt capacity, which should not be less than 90% at the end of 10 years and 80% at the end of 25 years.	All PV modules should have a nominal power output of >90% at STC during the first 10 years, and >80% during the next 15 years. Further, module shall have nominal power output of >97% during the first year of installation – degradation of the module below 0.5 % per annum.
5	Clause: 1.0 (19), Page 13 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	New Clause	Other details as per IS/IEC 61730-1 clause 11 should be provided at appropriate place. In addition to the above, the following information should also be provided: i. The actual Power Output Pmax shall be mentioned on the label pasted on the back side of PV Module. ii. The Maximum system voltage for which the module is suitable to be provided on the back sheet of the module. iii. Polarity of terminals or leads (colour coding is permissible) on junction Box housing near cable entry or cable and connector.
Inverter/ Power Conditioning Unit (PCU)			
6	Clause: 2.0 (1), Page 13 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	The inverter should be procured from Class I Local supplier, as per the MNRE guidelines/orders.	The inverter should be procured from Class I Local supplier, with the Quality Control Order dated 30.08.2017 for Solar Photovoltaic Inverters and its amendments thereof.

Sl	Clause, Page No.	Existing Clause	Amended Clause
7	Clause: 2.0 {6 (l)}, Page 14 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	The inverter must be qualified under the Energy Labelling Programme for Inverters as notified by Bureau of Energy Efficiency (BEE) and as amended from time to time. However, for hybrid inverters , the eligibility requirement shall be based on the minimum overall efficiency as per the table below:	The inverter must be qualified under the Energy Labelling Programme for Inverters as notified by Bureau of Energy Efficiency (BEE) and as amended from time to time. However, the eligibility requirement shall be based on the minimum overall efficiency as per the table below:
Module Mounting Structures (MMS)			
8	Clause: 3.0 (14), Page 18 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	Module Mounting Structures shall be designed to withstand the extreme weather conditions in the area as per National Building Code 2016 .	The Mounting structure shall be so designed to withstand the speed for the wind zone of the location where a PV system is proposed to be installed. The PV array structure design shall be appropriate with a factor of safety of minimum 1.5.
9	Clause: 3.0 (15), Page 18 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	The Mounting structure shall generally be designed to withstand the wind speed as per IS 875 Part 3 and wind speed of 180 km/hour or cyclonic winds in coastal area. Further structures in coastal areas shall be painted with marine paint.	The Mounting structure shall generally be designed to withstand the wind speed as per IS 875 Part 3 having factor of safety minimum 1.5 and wind speed of 180 km/hour or cyclonic winds in coastal area. Further structures in coastal areas shall be painted with marine paint.
10	Clause: 3.0 {19 (d)}, Page 18 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	New Clause related to MMS Structure.	Please refer to Appendix- I .

Sl	Clause, Page No.	Existing Clause	Amended Clause
Protections			
11	Clause: 8.0, 1(f), Page 21 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	New Clause	All metal casing/ shielding of the plant shall be thoroughly grounded in accordance with CEA Safety Regulation 2010. In addition, the lightning arrester/masts should also be earthed inside the array field.
12	Clause: 8.0, 2(e), Page 21 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	New Clause	The current carrying cable from lightning arrester to the earth pit should have sufficient current carrying capacity according to IEC 62305. According to standard, the minimum requirement for a lightning protection system designed for class of LPS III is a 6 mm ² copper/ 16 mm ² aluminum or GI strip bearing size 25*3 mm thick). Separate pipe for running earth wires of Lightning Arrester shall be used.
13	Clause: 9.0, (7), Page 22 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop less than 1.5% (DC Cable losses).	Sizes of cables between array interconnections, array to junction boxes, junction boxes to Inverter etc. shall be so selected to keep the voltage drop less than 2% (DC Cable losses).
14	Clause: 9.0, (7), Page 22 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	The size of each type of AC cable selected shall be based on minimum voltage drop. However, the maximum drop shall be limited to 1.5%.	The size of each type of AC cable selected shall be based on minimum voltage drop. However; the maximum drop shall be limited to 2% .
15	Annexure-A, Page 26 of 32 of Technical Specifications (7.0: Major components of Rooftop Solar PV System) for Rooftop Solar PV system under PMSGY Rev-00	New Clause	IS 16077 : 2013 / IEC 61646 : 2008: Thin - Film terrestrial photovoltaic (PV) modules - Design qualification and type approval.

SI	Clause, Page No.	Existing Clause	Amended Clause
General			
16	Clause: 3.0, Page 10 of 32 (Notes for Bid Price Schedule (BPS)) of Technical Specifications for Rooftop Solar PV system under PMSGY Rev-00 AND Clause 3.1: BRIEF SCOPRE OF WORK (Invitation for Bids) Page 3 of 7	The quoted price per kW in BPS shall be considered for the RTS system of capacity range 1-2 kW. For the RTS system of capacity above 2 kW, the price shall be considered 0.9 times the quoted price.	The quoted price per kW in BPS shall be considered for the RTS system of capacity range 1-2 kW, thereafter for each additional capacity above 2 KW , the price shall be considered as 0.9 times the quoted price.

Appendix- I to Amendment-2

3.0 Module Mounting Structures (MMS):

19 (d) RCC Elevated structure (As additional works): It can be divided into further three categories:

- A. Minimum clearance from roof (upto 1000 MM) (for reference only).
 - a. The structure shall be designed to allow easy replacement of any module and shall be in line with site requirement. The gap between module should be minimum 30MM.
 - b. Base Plate – Base plate thickness of the Structure should be 5MM for this segment.
 - c. Column – Structure Column should be minimum 2MM in Lip section / 3MM in C-Channel section. The minimum section should be 70MM in Web side and 40 MM in flange side in Lip section.
 - d. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C-Channel section. The minimum section should be 70MM in Web side (y-axis) and 40 MM in flange side (x-axis).
 - e. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.
 - f. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
 - g. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
 - h. For single portrait structure the minimum ground clearance should be 500MM.

- B. Medium clearance from roof (1000MM – 2000 MM) (for reference only)
 - a. Base Plate – Base plate thickness of the Structure should be Minimum 6MM for this segment.
 - b. Column – Structure Column should be minimum 2MM in Lip section / 3MM in C-Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.

- c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in C-Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
- e. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
- f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

C. Maximum clearance from roof (2000MM – 3000 MM) (for reference only)

- a. Base Plate – Base plate thickness of the Structure should be minimum 8 MM for this segment.
- b. Column – Structure Column thickness should be minimum 2.6MM in square hollow section (minimum 50x50) or rectangular hollow section (minimum 60x40) or 3MM in CChannel section.
- c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 80MM in Web side and 50MM in flange side in Lip section.
- e. Front/back bracing – The section for bracing part should be minimum 3MM thickness.
- f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.

D. Super elevated structure (More than 3000 MM clearance from roof) (for reference only)

A. Base structure

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- a. Base Plate – Base plate thickness of the Structure should be 10MM for this segment.
 - b. Column – Structure Column minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40).
 - c. Rafter - Structure Rafter minimum thickness should be minimum 2.9MM in square hollow section (minimum 60x60) or rectangular hollow section (minimum 80x40).
 - d. Cross bracing – Bracing for the connection of rafter and column should be of minimum thickness of 4mm L-angle with the help of minimum bolt diameter of 10mm.
- B. Upper structure of super elevated structure-
- a. Base Plate – Base plate thickness of the Structure should be minimum 5MM for this segment.
 - b. Column – Structure Column should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
 - c. Rafter - Structure rafter should be minimum 2MM in Lip section / 3MM in Channel section. The minimum section should be 70MM in Web side and 40MM in flange side in Lip section.
 - d. Purlin - Structure purlin should be minimum 2MM in Lip section. The minimum section should be 60MM in Web side and 40MM in flange side in Lip section.
 - e. Front/back bracing – The section for bracing part should be minimum 2MM thickness.
 - f. Connection – The structure connection should be bolted completely. Leg to rafter should be connected with minimum 12 diameter bolt. Rafter and
 - g. purlin should be connected with minimum 10 diameter bolt. Module mounting fasteners should be SS-304 only and remaining fasteners either SS-304 or HDG 8.8 Grade.
- C. If distance between two legs in X-Direction is more than 3M than sag angle/Bar should be provide for purlin to avoid deflection failure. The sag angle should be minimum 2MM thick, and bar should be minimum 12Dia.
- D. Degree - The Module alignment and tilt angle shell be calculated to provide the maximum annual energy output. This shall be decided on the location of array installation.

- E. Foundation – Foundation should be as per the roof condition; two types of the foundation can be done- either penetrating the roof or without penetrating the roof.
- a. If penetration on the roof is allowed (based on the client requirement) then minimum 12MM diameter anchor fasteners with minimum length 100MM can be used with proper chipping. The minimum RCC size should be 400x400x300 cubic mm. Material grade of foundation should be minimum M20.
 - b. If penetration on roof is not allowed, then foundation can be done with the help of 'J Bolt' (refer IS 5624 for foundation hardware). Proper Neto bond solution should be used to adhere the Foundation block with the RCC roof. Foundation J - bolt length should be minimum 12MM diameter and length should be minimum 300MM.
- F. Material standards:
- a. Design of foundation for mounting the structure should be as per defined standards which clearly states the Load Bearing Capacity & other relevant parameters for foundation design (As per IS 6403 / 456 / 4091 / 875).
 - b. Grade of raw material to be used for mounting the structures so that it complies the defined wind loading conditions (As per IS 875 - III) should be referred as follows (IS 2062 – for angles and channels, IS 1079 – for sheet, IS 1161 & 1239 for round pipes, IS 4923 for rectangular and square hollow section).
 - c. Test reports for the raw material should be as per IS 1852 / 808 / 2062 / 1079 / 811.
 - d. In process inspection report as per approved drawing & tolerance should be as per IS 7215.
 - e. For ascertaining proper welding of structure part following should be referred:
 - f. D.P. Test (Pin Hole / Crack) (IS 822)
 - g. Weld wire grade should be of grade (ER 70 S - 6)
 - h. For ascertaining hot dip galvanizing of fabricated structure following should be referred:
 - i. Min coating required should be as per IS 4759 & EN 1461.
 - j. Testing of galvanized material
 - a) Pierce Test (IS 2633)
 - b) Mass of Zinc (IS 6745)
 - c) Adhesion Test (IS 2629)
 - d) CuSO₄ Test (IS 2633)

- e) Superior High-Grade Zinc Ingot should be of 99.999% purity (IS 209) (Preferably Hindustan Zinc Limited or Equivalent).
- k. Foundation Hardware – If using foundation bolt in foundation then it should be as per IS 5624.